



**(43) International Publication Date**  
**15 April 2004 (15.04.2004)**

## PCT

**(10) International Publication Number**  
**WO 2004/032489 A3**

**(51) International Patent Classification<sup>7</sup>: H04N 3/15, 5/217**

**(21) International Application Number:**  
PCT/GB2003/004277

**(22) International Filing Date:** 3 October 2003 (03.10.2003)

(25) Filing Language: English

(26) **Publication Language:** English

**(30) Priority Data:**  
0222990.4      4 October 2002 (04.10.2002)      GB

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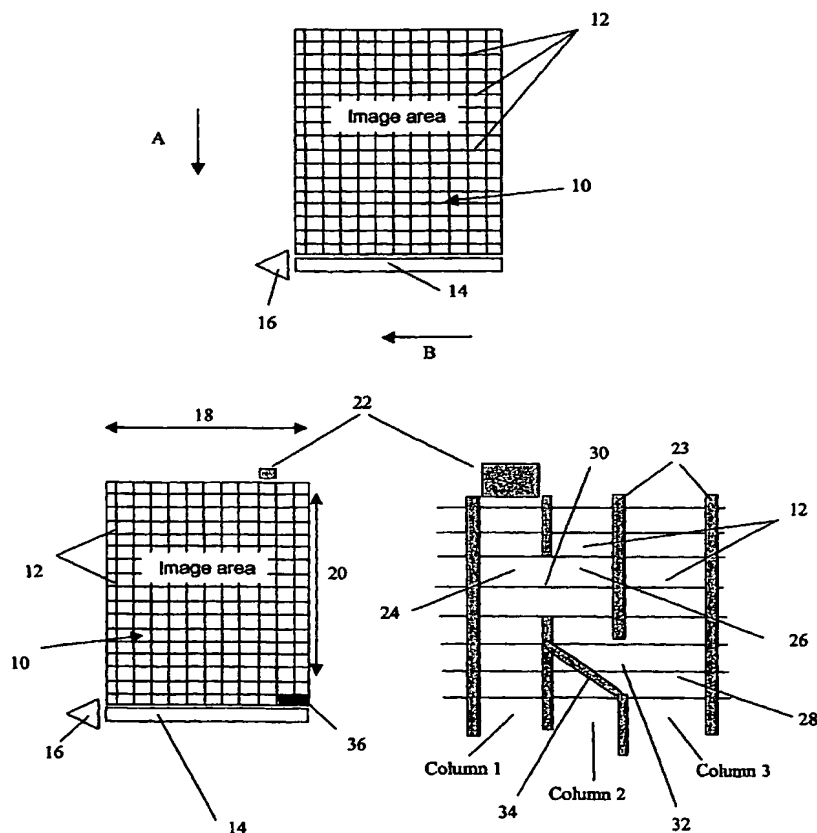
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**(81) Designated States (national):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

**(84) Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

*[Continued on next page]*

**(54) Title: SOLID STATE IMAGER**



**(57) Abstract:** A charge division arrangement for a CCD device for producing a divided charge output from an input charge, comprising an input for receiving an input charge, an array of elements and an output. The array of elements being arranged in rows and columns and having clock connections to allow charge in each row to be successively clocked from one row of elements to the next. At least some of the elements being arranged in a charge division unit having a first element and a second element in adjacent columns and being communicable at least temporarily so that charged introduced into the first element is divided between the first element and the second element, the charge division unit being arranged to produce divided charge for production at the output. The arrangement allows a small amount of charge to be introduced into a CCD circuit.



SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**(88) Date of publication of the international search report:**

2 December 2004

# INTERNATIONAL SEARCH REPORT

International Application No

1/GB 03/04277

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H04N3/15 H04N5/217

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 715 001 A (MATSUNAGA YOSHIYUKI ET AL) 3 February 1998 (1998-02-03) column 9, lines 1-17; figure 13	1-10
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 04, 31 May 1995 (1995-05-31) & JP 7 023294 A (SONY CORP), 24 January 1995 (1995-01-24) abstract	1-10
A	US 4 737 841 A (KINOSHITA TAKAO ET AL) 12 April 1988 (1988-04-12) column 4, lines 27-39; figure 1	1,10
A	EP 0 473 966 A (SONY CORP) 11 March 1992 (1992-03-11) column 6, lines 34-45; figure 3	1,10

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

6 October 2004

Date of mailing of the international search report

14/10/2004

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

T/GB 03/04277

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5715001	A	03-02-1998	JP 3378352 B2 JP 7288745 A	17-02-2003 31-10-1995
JP 7023294	A	24-01-1995	NONE	
US 4737841	A	12-04-1988	JP 61015475 A US 4811105 A	23-01-1986 07-03-1989
EP 0473966	A	11-03-1992	JP 4096481 A JP 2867655 B2 JP 4096480 A DE 69118279 D1 DE 69118279 T2 EP 0473966 A1 KR 230468 B1 SG 81892 A1 US 5384596 A	27-03-1992 08-03-1999 27-03-1992 02-05-1996 31-10-1996 11-03-1992 15-11-1999 24-07-2001 24-01-1995